

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number  
**WO 2005/089429 A3**

(51) International Patent Classification:

C12N 9/10 (2006.01) C07H 21/04 (2006.01)  
C12N 1/21 (2006.01) C12Q 1/48 (2006.01)  
C12N 15/02 (2006.01) A61K 38/45 (2006.01)  
C12N 15/63 (2006.01) A61K 39/40 (2006.01)  
C07K 16/40 (2006.01) A61K 47/00 (2006.01)  
C07K 14/435 (2006.01) A01N 43/04 (2006.01)

(21) International Application Number:

PCT/US2005/008906

(22) International Filing Date: 17 March 2005 (17.03.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/554,085 17 March 2004 (17.03.2004) US  
60/614,817 30 September 2004 (30.09.2004) US

(71) Applicant (for all designated States except US): **UNIVERSITY OF VIRGINIA PATENT FOUNDATION**  
[US/US]; 250 West Main Street, Suite 300, Charlottesville, VA 22902 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KIM, Young-Hwan**  
[KR/US]; 2000 Ashmere Drive, Charlottesville, VA 22902 (US). **HERR, John, C.** [US/US]; 895 Old Ballard Road, Charlottesville, VA 22901 (US).

(74) Agent: **SPARKS, Rodney, L.**; University of Virginia Patent Foundation, 1224 West Main Street, Suite 1-110, Charlottesville, VA 22903 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:

9 November 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **SFEC, A SPERM FLAGELLAR ENERGY CARRIER PROTEIN**

(57) Abstract: The present invention is directed to a sperm flagellar energy carrier protein, SFEC, isolated nucleic acids encoding an SFEC protein or peptide, antibodies specific for the SFEC protein, and the use of the SFEC protein to identify antagonists of SFEC activity. The present invention is also directed to methods of contraception encompassing regulating SFEC expression, levels, and function. SFEC is believed to be essential for sperm motility, is localized to a specific region of the sperm, and thus antagonists of SFEC activity are anticipated to have utility as contraceptive agents.



WO 2005/089429 A3

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/08906

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: C12N 9/10( 2006.01),1/21( 2006.01),15/02( 2006.01),15/63( 2006.01);C07K 16/40( 2006.01),14/435( 2006.01);C07H 21/04( 2006.01);C12Q 1/48( 2006.01);A61K 38/45( 2006.01),39/40( 2006.01),47/00( 2006.01);A01N 43/04( 2006.01)

USPC: 435/15,193,252.3,320.1,325;424/94.5,130.1;514/44,789;530/387.1,350;536/23.2,23.5

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/15,193,252.3,320.1,325;424/94.5,130.1;514/44,789;530/387.1,350;536/23.2,23.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/12659 A2 (WIEMANN) 22 February 2001 (22.02.2001), SEQ ID NO:779 (1803 bp) is 98.5 % identical to SEQ ID NO:1; the encoded sequence (315 aa) is 100% identical to SEQ ID NO:2.	1-37
X	WO 02/12340 A2 (YUE et al) 14 February 2002 (14.02.2002), SEQ ID NO: 49 (1781 bp) is 98.9 % identical to SEQ ID NO:1; the encoded TRICH-19 protein (315 aa) is 100% identical to SEQ ID NO:2.	1-37

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

23 June 2006 (23.06.2006)

Date of mailing of the international search report

11 AUG 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Elizabeth Slobodyansky, PhD

Telephone No. 571-272-1600

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US05/08906

Continuation of B. FIELDS SEARCHED Item 3:  
WEST, STN cluster (MEDLINE, CAPLUS, SCISEARCH, BIOSIS)

WEST, STN cluster searched (MEDLINE, CAPLUS, BIOSIS, SCISEARCH)  
search terms: translocase adp /atp, carrier protein, human, sequence or gene